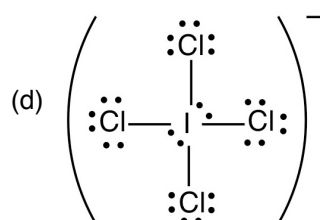
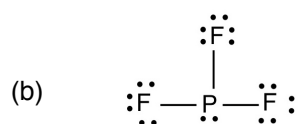
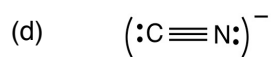
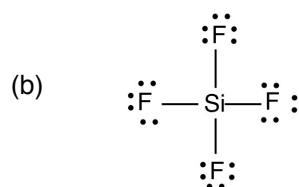
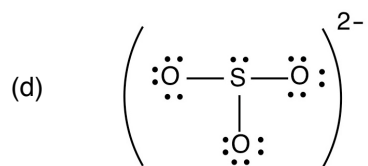
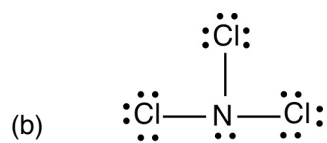
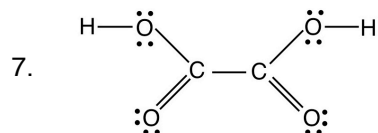
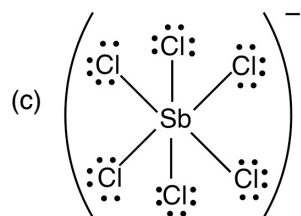
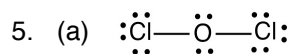
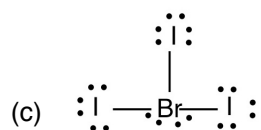
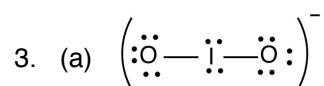
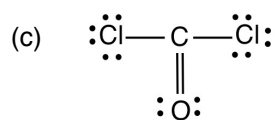
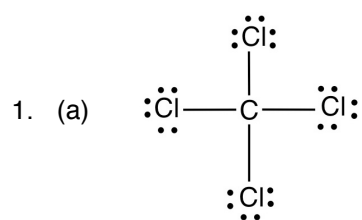
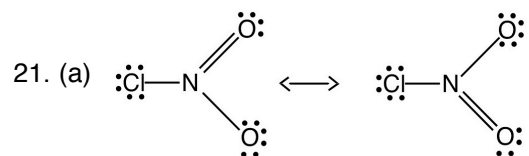
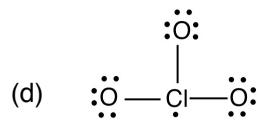
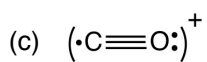
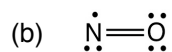
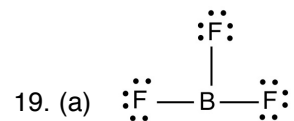
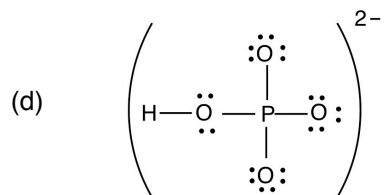
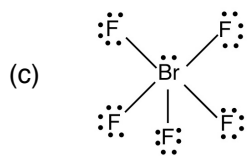
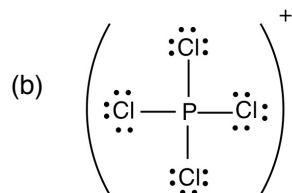
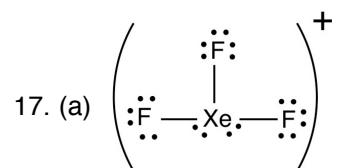
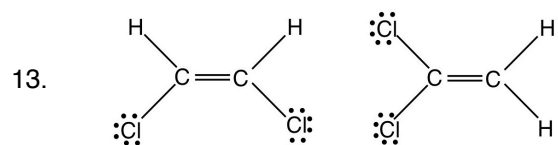
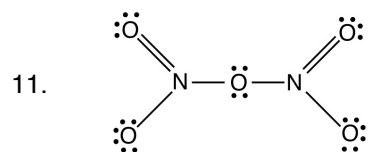
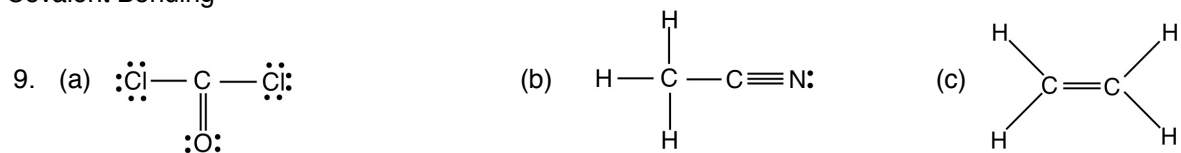
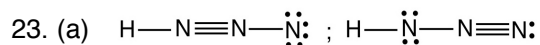
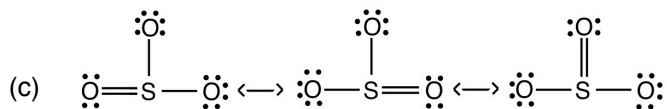
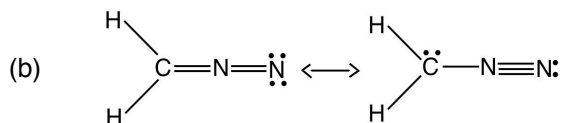


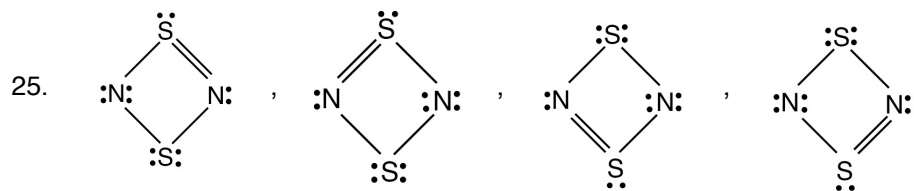
PROBLEMS







(b) no; different arrangement of atoms



27. (a) $\text{S} = +1$

(b) Both H atoms = 0

(c) $\text{O}=\text{O}-\text{O}$: 1st O = 0, 2nd O = +1, 3rd O = -1

29. Structure I: H = 0, O = 0, N = 0, O = 0; better

Structure II: H = 0, O = 0, N = +1, O = -1

31. (a) linear

(b) linear

(c) trigonal planar

(d) square planar

33. (a) linear

(b) trigonal pyramid

(c) tetrahedral

(d) linear

35. (a) octahedral

(b) T-shaped

(c) see-saw

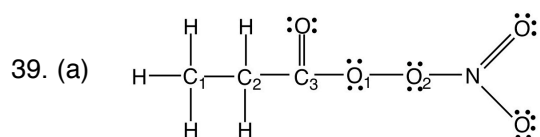
(d) tetrahedral

37. (a) 109.5°

(b) 180°

(c) 109.5° around C at left, 120° around C at right, 109.5° around N

(d) 120° around C at left and at center; 180° around C at right



(b) 109.5° around C_1 , C_2 ; 120° around C_3 ; 109.5° around both O atoms; 120° around N

41. 1 = 120° , 2 = 109.5° , 3 = 120°

43. (a)

45. (b), (c), (d)

47. 1st and 3rd molecules

49. (a) sp (b) sp^3d (c) sp^2 (d) sp^3d^2

51. (a) sp^3d (b) sp^3 (c) sp^3 (d) sp

53. (a) sp^3d^2 (b) sp^3d (c) sp^3d (d) sp^3

55. (a) 5; sp^3d (b) 6; sp^3d^2 (c) 6; sp^3d^2

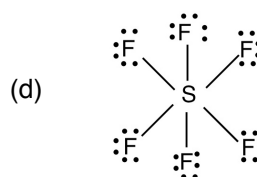
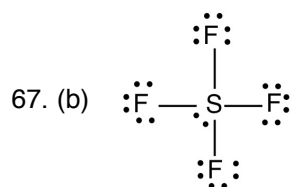
57. Both C atoms sp^3 ; S and O atoms sp^2

59. (a) sp^2 (b) sp^3 (c) sp (d) sp

61. (a) sp^2 (b) sp^2 (c) sp^3

63. 9 sigma, 1 pi

65. (a) 3 sigma, 1 pi (b) 3 sigma (c) 1 sigma, 2 pi (d) 2 sigma, 2 pi

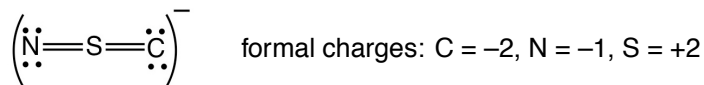
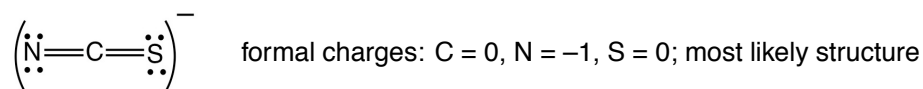
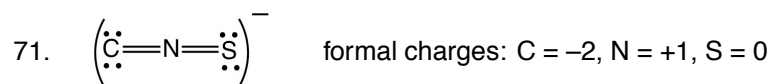


69. (a) 20 sigma, 2 pi

(b) 12

(c) 1 = 109.5° , 2 = 109.5° , 3 = 120°

(d) A = sp^3 , B = sp^2 , C = sp^2



73. (a) AX₄E₂; square planar (b) AX₅; trigonal bipyramid (c) AX₂E; bent
(d) AX₃E₂; T-shaped (e) AX₂E₂; bent (f) AX₅E₂; square pyramid

75. (a) NH₃, NH₄⁺ (b) N₂, CN⁻ (c) NO (d) H₂CO₃ (e) XeF₂²⁻

77. (a) atom surrounded by more than four electron pairs

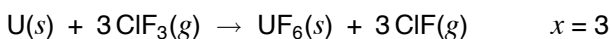
(b) see pp. 170, 171

(c) lone pair on a single atom

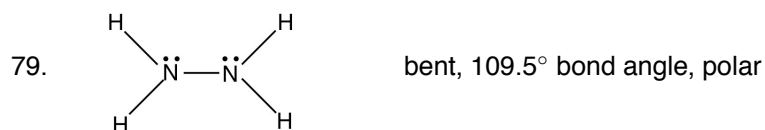
(d) molecule or ion containing an odd number of electrons (i.e., 5, 7, 9, ...)

$$78. \text{ mol CIF} = \frac{(3.00 \text{ atm})(0.457 \text{ L})}{(0.0821 \text{ L} \cdot \text{atm/mol} \cdot \text{K})(348 \text{ K})} = 0.0480$$

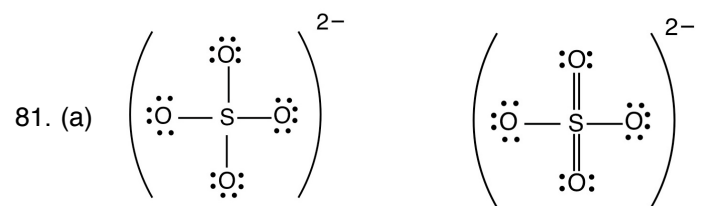
$$\text{mol UF}_6 = \frac{5.63 \text{ g}}{(352.0 \text{ g/mol})} = 0.0160; \quad \frac{0.0480 \text{ mol CIF}}{0.0160 \text{ mol UF}_6} = \frac{3 \text{ mol CIF}}{1 \text{ mol UF}_6}$$



T-shaped; polar; 90°, 180°; sp³d; 3 sigma



80. 6, sp³d², octahedral



(b) tetrahedral

(c) sp^3

(d) First structure: S = +2, O = -1; second structure: S = 0, O = {-1, -1, 0, 0}

